

WPS 0850

HB1-151

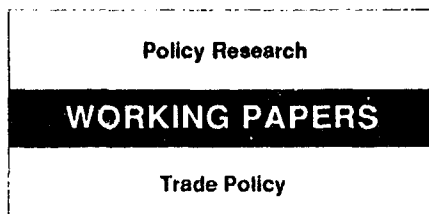
Country Economics Department
The World Bank
February 1992
WPS 850

Fiscal Adjustment and the Real Exchange Rate

The Case of Bangladesh

Kazi M. Matin

How cuts in government spending affect the real exchange rate depends on whether a government achieves fiscal adjustment through proportionate cuts in capital and current spending or through disproportionate cuts in capital spending. Disproportionate cuts in capital spending may shift the balance of government spending toward nontradables. As a result, the real exchange rate tends to appreciate — which could undermine the effectiveness of simultaneous trade liberalization.



WPS 850

This paper — a product of the Trade Policy Division, Country Economics Department — is part of a larger research project on the sustainability of trade reform in structural adjustment loans (RPO 675-32). The paper was presented at Bank seminars held in August and October 1991. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Dawn Ballantyne, room N10-007, extension 38004 (42 pages). February 1992.

Matin examines the effect of fiscal adjustment on the real exchange rate. He argues that the direction and extent of that effect depend on the way fiscal adjustment is carried out. If a fiscal deficit is reduced mainly by reducing total government spending, the effect on the real exchange rate depends on whether the adjustment is achieved through proportionate cuts in both capital and current spending or through disproportionately greater cuts in capital spending. A disproportionately high cut in capital spending affects the composition of government spending between tradables and nontradables.

Matin extends the dependent-economy model of the real exchange rate, incorporating both the level and composition of government spending. He then estimates the model for Bangladesh, a country that reduced total government spending in the face of growing current expenditures. Bangladesh's fiscal adjustment involved an unsustainably large decline in capital spending as a share of total spending.

Econometric estimates of the model for Bangladesh show that the propensity to spend on

nontradables is greater for government spending than for private spending and greater for the government's current spending than for its capital spending. This result is highly robust across different measures of the real exchange rate and across different methods of estimation. Thus as Bangladesh's fiscal adjustment shifted government spending toward nontradables, the real exchange rate tended to appreciate.

Matin emphasizes two important implications of such fiscal adjustment for developing countries like Bangladesh:

- When fiscal adjustment involves unsustainably heavy cuts in capital spending (a trend that is now being reversed in Bangladesh), appreciation of the real exchange rate misaligns that rate, causing a misallocation of resources.
- When disproportionate cuts in capital spending occur at the same time as trade liberalization, appreciation of the real exchange rate undermines the effectiveness of trade liberalization.

The Policy Research Working Paper Series disseminates the findings of work under way in the Bank. An objective of the series is to get these findings out quickly, even if presentations are less than fully polished. The findings, interpretations, and conclusions in these papers do not necessarily represent official Bank policy.

Table of Contents

I.	Introduction.....	1
II.	Bangladesh's Fiscal Adjustment in the 1980s.....	5
	Overview.....	5
	Adjustment.....	7
III.	Dependent Economy Model of Real Exchange Rate With Government Expenditure.....	10
	The Model.....	10
	Fundamentals Affecting RER.....	13
	Basic Model for RER.....	14
IV.	Econometric Estimation of the RER Model.....	18
	Estimation Results of Basic Model.....	18
	Simultaneity Bias.....	19
	Estimation Results of Reduced Form Model.....	21
	i) Government Expenditure.....	22
	ii) Terms of Trade.....	23
	Elasticity Estimates.....	24
VI.	Implications of Fiscal Adjustment.....	25
	Alternative Fiscal Adjustment.....	25
	Trade Liberalization.....	27
	Misaligned RER.....	28
	Conclusions.....	30
	Data Annex.....	32
	Tables and Figures.....	34
	References.....	41

This work is part of the research project on Sustainability of Trade Reforms in SALs (RPO 675-32). The author would like to thank Jaime de Melo, Pradeep Mitra, Ichiro Otani, Arvind Panagariya, Ram Agarwala, Jim Sackey, Jim Tybout and participants at Trade Policy Division Seminar for comments and Partha Mukhopadhyay for excellent research assistance.

I. INTRODUCTION

The success of fiscal adjustment depends not only on the size of deficit reduction but also on the way it is reduced. The same reduction in fiscal deficit can have different macroeconomic and microeconomic implications (Tanzi 1989) if different combinations of tax and expenditure cuts are used to achieve it. Similarly, the same cut in total expenditure can have different effects depending on the way it is cut and how that alters the composition of government expenditure. For example fiscal adjustment that falls predominantly on government's capital expenditure has been found to have an adverse effect on private investment and thus on overall growth (Chhibber & Dailami, 1990 , Faini and de Melo 1991).

This paper explores another effect of fiscal adjustment: the effect of changing composition of government expenditure on the real exchange rate. Typically rising fiscal deficits and its inflationary financing appreciate the real exchange rate, when such financing is inconsistent with the pegged nominal exchange rate (Edwards 1989). Fiscal adjustment seeks to restore macro-stability and competitiveness by reducing fiscal deficits to a level that can be financed in a non-inflationary manner (Tanzi 1990). This paper shows that if reductions in fiscal deficit is accompanied by a substantial shift in the composition of

government expenditure towards consumption, fiscal adjustment tends to appreciate the real exchange rate (RER).

This incipient real appreciation generated by fiscal adjustment is of concern for at least two reasons. First, though this RER movement is in response to a shift in a "fundamental" (e.g. in the composition of government expenditure arising from fiscal adjustment) it may not be an equilibrium movement of the RER if the shift in "fundamental" is not sustainable and thus temporary (Lizondo 1989). Ideally, the RER should not appreciate because wholly temporary shifts in fundamentals do not alter the long-run equilibrium real exchange rate. However, if the private sector either does not perceive the unsustainability of a shift in expenditure composition, or it perceives the unsustainability but is constrained from responding appropriately to it (e.g. is liquidity constrained), the RER appreciation will inevitably be larger than is warranted by long-run equilibrium. In the presence of imperfections in domestic capital market, adjustment costs and other externalities, this appreciation can result in substantial misallocation of resources. (Neary and Van Wijnbergen 1986). Second, if trade liberalization and fiscal adjustment are implemented simultaneously as is often the case,¹ any RER appreciation (whether 'equilibrium' or not) gives confusing "signals" to producers and thus undermines the credibility of trade liberalization (Corbo and De Melo 1987, Rodrik 1989).

Surprisingly however, the effect of such fiscal adjustment on the real exchange rate (RER) has not been well appreciated in the literature. Most of the

¹In most of the forty countries receiving "trade" adjustment loans between 1979 and 1987, trade policy reform and fiscal adjustment were carried out simultaneously (Thomas, Martin and Nash, 1990, p. 2, 8).

theoretical studies on fiscal policy and the real exchange rate (see Penati 1983 for a survey) have focused on the real exchange rate effect of changes in the level of total government expenditure.

Only recently, a few papers have examined the theoretical link between the changes in the composition of government expenditure and real exchange rate (Monteill 1986, Khan and Lizondo 1987). Khan and Lizondo (1987) show that for a small open economy, the reduction in government expenditure that falls wholly on tradables has no effect on the real exchange rate because prices of non tradables are not altered by this reduction. However, when the same reduction in expenditure falls entirely on non-tradables, it depreciates the real exchange rate. Similarly, increases in government's propensity to spend on non-tradables with no change in expenditure levels, appreciates the real exchange rate (Monteill 1986).

Most empirical work on real exchange rate models for developing countries (Edwards 1989, Cottani et al 1991, Easterly 1991, Rodriguez, 1991) have also ignored the effect of changes in the composition of government expenditure on RER. Barring one exception (Ramangkura and Nidhiprabha 1991), the composition of government expenditure do not feature in their econometric models.

This paper develops a dependent economy model of 'equilibrium' real exchange rate that incorporates not only the level but also the composition of government expenditure. The distinctive feature of this model is that it allows for differences between current and capital expenditure in terms of their propensities to spend on non-tradables. This means changes in the share of

capital expenditure in total expenditure can alter the composition of total expenditure between tradables and non tradables. However the direction of the real exchange rate effect of changes in level and composition of expenditure are a priori ambiguous and must be ascertained empirically.

This model of real exchange rate is estimated with data from Bangladesh. Though many developing countries have experienced changes in the composition of government expenditure², Bangladesh presents an interesting case for several reasons. First unlike other countries that reduced total expenditure by reducing capital expenditure more than current expenditure (Hicks 1991), Bangladesh reduced total expenditure in the face of rising current expenditure. This implied a much larger shift in the composition of government expenditure towards consumption or current expenditure than in most other countries. Second, given the higher propensity of government's current outlays to spend on non tradables, this large shift in composition towards current expenditure implied an equally large shift in composition towards non-tradables. Third, since fiscal adjustment and trade liberalization is being implemented simultaneously in Bangladesh, the effect of fiscal adjustment on RER is of considerable interest.

The paper is organized as follows: Section II describes the nature of Bangladesh's fiscal adjustment over the 1980s. Section III develops the dependent-economy model of equilibrium real exchange rate and Section IV undertakes econometric estimation of the model. Section V concludes by highlighting the implications of the results.

²A recent review of adjustment experience in the IMF shows that in nearly a dozen countries fiscal adjustment was accompanied by a rise in current expenditure and a large decline in capital expenditure.

II. BANGLADESH'S FISCAL ADJUSTMENT IN THE 1980s

Bangladesh's fiscal adjustment since fiscal year (FY) 1983 (i.e. 1982/83) succeeded in reducing deficits sufficiently to eliminate inflationary financing of deficits. The reduction in fiscal deficit was made possible by cuts in total government expenditure.³ However, since such cuts in total expenditure were accompanied by growth in current expenditure, capital expenditure fell by one and half times the fall in total expenditure, as a share of GDP. This led to a substantial change in the composition of government expenditure towards current expenditure and consumption. As the propensity to spend on non-tradables was greater for current than for capital expenditure, fiscal adjustment over the 1980s raised the expenditure-share of non tradables in total government expenditure substantially.

Overview

Bangladesh's fiscal deficit has averaged around 8 percent of GDP over the last two decades. In six of those years, it averaged around 10 percent of GDP, four of which were in the early 1980s. Fiscal deficit has fluctuated from a low of 2.5 percent in FY 1975 to a high of 11 percent in FY 1983. As in so many other developing countries, the fiscal deficit has remained high largely because of political and administrative inability to mobilize additional revenue.

³The level of Bangladesh's total government expenditures relative to GDP is not high by developing country standards. The average for India, Indonesia, Pakistan, Sri Lanka and Thailand is 27.4% (World Bank 1989 p.4). At its peak in FY 1983 Bangladesh's expenditure was 19.3% of GDP; the average is around 17%.

Bangladesh's government revenue averaged about 9% of GDP over nearly two decades, which is a little more than half that for the low-income countries as a group.⁴

Though the fiscal deficit has been high, inflation has been lower than in most developing countries with deficits of comparable magnitude.⁵ Only in four years has inflationary financing of the fiscal deficit been substantial: the first two years after independence, and in FY 1980 and 1981. Sharp increases in capital or (the Annual Development Program, ADP) expenditure⁶ and a rise in government food imports caused by a severe drought expanded both the fiscal deficit and its inflationary financing in FY 1980. Stabilization efforts in the form of increased tax revenue and reduced capital or ADP expenditure lowered the fiscal deficit slightly in FY 1981. However an unanticipated shortfall in aid inflow led to larger instead of smaller inflationary financing in that year (Matin 1990).

⁴For a sample of 25 low income countries (World Bank 1988 p 46.) revenue was 15.4% of GDP in 1985. The average revenue for the five countries of the region (India, Indonesia, Pakistan, Sri Lanka and Thailand) is 21.1% of GDP (World Bank 1989 p. 4).

⁵Bangladesh's annual average inflation rate of around 12 percent is substantially below the average for non-oil developing countries as a group. In only three years out of eighteen, did inflation exceed 20 percent. The loose link between fiscal deficit and inflation is owed mainly to its external financing.

⁶Annual Development Program (ADP) expenditure consists predominantly of projects that is the main source of public capital formation.

Adjustment

The fiscal deficit was reduced after FY 1983⁷ mainly through expenditure compression, as the government failed to generate the needed increases in revenue. More than four-fifth of the reduction in fiscal deficit between FY 1983 and 1990 was accomplished through expenditure compression (Table 1). As fiscal deficit fell from 11 percent of GDP to 8.1 percent over that period, total government expenditure fell from 19.7% to 17.4% of GDP.

This fall in total government expenditure was not as significant as the change in the composition of total expenditure that accompanied fiscal adjustment. Capital (ADP) expenditure fell by 3.4 percent of GDP which was one-and-half times the fall in total expenditure. On the other hand, current expenditure instead of falling, rose by 2.1 percent of GDP.⁸ Figure 1 highlights the fact that these trend changes were sustained for most of the 1980s.

This opposite movement in current and ADP expenditure led to a large shift in the composition of government expenditure. The share of capital expenditure in total expenditure fell from 52% to 39% over the same period. In addition within capital expenditure, the components of capital expenditure on

⁷The average fiscal deficit stood at around 10% of GDP over the period FY 1980-1984, peaking at 11% in FY 1983.

⁸They do not add up to the decline in total expenditure i.e. 2.3% of GDP, because "other capital expenditure" and "Food Account" expenditures are not included in ADP and current expenditure cited in Table 1.

infrastructure and on provision of economic services experienced the largest decline.⁹

Thus the nature of Bangladesh's fiscal adjustment tended to alter the composition of government's total expenditure in favor of non-tradables in two ways. As the propensity to spend on non tradables was greater for current than for capital expenditure, a rising share of current expenditure¹⁰ in total government expenditure increased the expenditure share of non tradables. In addition greater declines in capital expenditure on infrastructure raised the share of non-tradables in capital expenditure relative to FY 1983.

The decline in the share of capital expenditure tended to appreciate the real exchange rate (RER). Figure 2 shows the movements in three different measures of the RER¹¹ in the top panel, and changes in the composition of total expenditure in the bottom panel. Though composition of government expenditure

⁹The share of ADP expenditure on both economic services and infrastructure as a whole fell from 53.1% in 1982/83 to 70.8% in 1989/90. In view of the relatively lower intensity of tradables in the capital (ADP) expenditure on social sector, the above implies a clear increase in the non-tradable-component of development expenditure as well.

¹⁰The coefficient of the government expenditure composition variable obtained from an estimated import demand function confirms that in Bangladesh, capital or ADP expenditure is more intensive in tradables (i.e. in imports) than current expenditure (see Matin 1991).

¹¹This is the ratio of non-tradable price to the price of traded goods. Non-tradable price is proxied by CPI for one measure (RPT) and by adjusted CPI (i.e. CPI purged of import prices in another (RPT1). See Annex on Data for details.

is only one of several 'fundamentals' affecting the RER, it is interesting to find a strongly negative relationship between RER movements on the one hand and changes in the share of capital expenditure on the other hand especially after

III. DEPENDENT-ECONOMY MODEL OF REAL EXCHANGE RATE WITH GOVERNMENT EXPENDITURE

We derive an equilibrium real exchange rate (RER) model for econometric estimation, by extending the model in Rodriguez (1989) to incorporate both the size of total government expenditure and the composition of that expenditure. For this purpose we distinguish between private and government demand for non-tradables and between government's current and capital expenditure so as to accommodate different propensities to spend on non-tradables.

The Model

The model is based on three goods: non tradables (N), import competing (M) and exportables (X) whose prices in domestic currency are P_N , P_M and P_X . The supply of non-tradables (Y_N) can be represented as a function of three nominal prices and nominal output. Deflating nominal prices and output by P_N and assuming that the share of nontradables in GDP is only a function of relative prices only we get:

$$(1) \quad Y_N = Y_N (P_M/P_N, P_X/P_N) * Y$$

where $Y_N (.)$ is the share of N in GDP and Y is real GDP expressed in non-tradables. Equation (1) can be expressed in terms of the real exchange rate ($e = P_N/P_T$) and the terms of trade ($T = P_X/P_M$)¹² as follows:

$$(2) \quad Y_N = a(e, T) Y$$

¹²If P_T is a price index of the two tradables prices $P_T = F(P_X, P_M)$ homogenous of degree one, then $P_T = f(P_X/P_M) P_M$.

The supply of non-tradables is a positive function of the real exchange rate and a negative or positive function of the terms of trade.

On the demand side we extend Rodriguez (1989) by distinguishing between various types of expenditure. This extension can accommodate (a) differences in the propensity of private and government sector to spend on non tradables, and (b) differences in the propensity of government's current and capital outlays to spend on non tradables.

Private demand for non tradables (D_{pn}) is shown as a function of the real exchange rate (e) terms of trade (T) and total private spending (D_p)

$$(3) \quad D_{pn} = b(e, T) D_p$$

Private demand for non-tradables is thus a negative function of the real exchange rate and a positive or negative function of the terms of trade.

Total government expenditure (D_g) which is a share 'g' of total output 'Y' (i.e. gY) is equal to the sum of current expenditure C_g and capital expenditure I_g . Government expenditure on non-tradables (D_{gn}) is a weighted average of current and capital expenditures, with the shares of non-tradables (d_c and d_i) in each type of government expenditure as weights. Thus:

$$(4) \quad d_c C_g + d_i I_g = D_{gn}$$

Dividing both sides by D_g we get

$$(5) \quad d_c(1-\tau_1) + d_1 \tau_1 = d$$

where τ_1 is the share of capital expenditure in total expenditure and 'd' is the fraction of total government expenditure spent on non-tradables. This fraction 'd' is a function of τ_1 and the relative propensity of the two types of government expenditure to spend on non tradables (i.e. d_c and d_1). Thus:

$$(6) \quad D_{gn} = d(\tau_1) g Y$$

Equilibrium in the non tradables market yields the equilibrium real exchange rate (e^*). For such equilibrium, supply of non tradables must equal its demand. Thus:

$$(7) \quad a(e, T) Y = b(e, T) (E - gY) + d(\tau_1) gY$$

where E is the total aggregate expenditure in the economy and private expenditure, $D_p = E - gY$. By definition we have

$$(8) \quad E = (1 - cas) Y$$

where cas is the ratio of current account surplus to Y. Thus substituting (8) in (7) and rearranging we get:

$$(9) \quad b(e, T) (1 - cas - g) + d(\tau_1) g = a(e, T)$$

Solving (9) for e^* or the equilibrium real exchange rate we get:

$$(10) e^* = e(cas, T, g, \tau_1)$$

Equation (10) is the derived real exchange rate (RER) model.

Fundamentals Affecting RER

The above model of equilibrium real exchange rate (RER) determination suggest that there are four fundamentals that affect the RER. However, with the exception of "cas", the a priori direction of their effects are ambiguous.

Increases in the excess of aggregate expenditure over aggregate income, or in the current account deficit (i.e. -cas) appreciates the RER. Assuming both tradables and non-tradables to be normal goods, increases in capital inflow (i.e. increases in aggregate expenditure over income) appreciates the RER because the demand for non-tradables is likely to rise relative to supply.¹³ The extent of this real appreciation depends on the income elasticity of demand and the price elasticities of both demand and supply of non-tradables.

The larger the income elasticity the greater the real appreciation and the higher the supply price elasticity the lower the real appreciation: If aid flows relaxes certain import constraints and this increases the supply of non-

¹³Though most types of capital inflows including aid have such an effect, some types of aid may not. It is conceivable however that some capital inflow like aid in the form of goods or aid used to import an aircraft or a ship has little or no effect on the RER because it has no spending effect on non-tradables. But even in this case a spending effect on non-tradables is ruled out only if this import of aircraft or ship is a net addition to the economy's supply of imports. Otherwise if the aircraft or ship would be imported anyway with domestic resources, even this aid frees resources that can be spent on non-tradables.

tradables, the resulting RER appreciation may be small, notwithstanding a large income elasticity of demand.¹⁴

For a given capital inflow or a given current account deficit fiscal adjustment affects the RER. Sustainable changes in the level of government expenditure (e.g. its share in GDP) and in its composition will alter the equilibrium RER. The direction of the effect is ambiguous in both cases. If the government as a whole has higher propensity to spend on non-tradables than the private sector, then an increase in the GDP share of government expenditure ('g') will result in a real appreciation. Conversely, if government has a relatively lower propensity, increases in the GDP share of government expenditure will lead to a real depreciation. Thus the impact of increases in size of government expenditure ('g') on the RER could go either way.¹⁵

If government's propensity to spend on non-tradables differ between current and capital expenditure then changes in composition (e.g. in the share of capital expenditure in total government expenditure) will have a separate impact on the RER (Lizondo & Khan 1987, Monteil 1986). Again the direction of its impact is an empirical issue.

¹⁴For example, if aid relaxes the constraints on imports of intermediate inputs used in constructing buildings/housing, it would raise supply of non tradables.

¹⁵Empirical estimates of RER equations have reported both positive and negative signs for the coefficient on the size of government expenditure (Easterly 1991, Rodriguez 1991, Edwards 1989).

The effect of changes in terms of trade¹⁶ (T) depends on the relative strength of income and substitution effects. Adverse shifts in the external terms of trade will affect Bangladesh's aggregate budget constraint and thus exert a negative income effect on demand for non-tradables irrespective of whether import prices rise or export prices fall. The substitution effect will also lower demand for non-tradables if there is a decrease in export prices but this is not likely to be large in Bangladesh. If however import prices rise, then the magnitude of the net effect depends on substitutability between imports and non-tradables. So long as the income effect is stronger than the substitution effect, RER will depreciate when terms of trade deteriorate.

Basic Model for RER

We augment the RER model derived in equation (10) by adding two other variables discussed in the literature: a proxy for relative growth in productivity of tradable sector and a nominal variable like exchange rate or domestic credit.

The first relates to the RER effect of productivity growth in the tradable sector. It has been argued that major differences in productivity among countries arise from productivity differences in the countries' tradable sector rather than in the non-tradable sector (Balassa 1964, p. 586). If productivity growth in a country's tradable sector is greater than that in another country,

¹⁶The terms of trade variable could be augmented by the effect of domestic controls, taxes and subsidies on import and export prices, or an additional variable could be added to capture the effect of trade reform. For that, a good proxy for changes in controls, taxes and subsidies on imports is necessary.

then its wage will rise and its real exchange rate will appreciate (Balassa p. 586). Thus if Bangladesh's productivity in tradable sector grows faster (slower) than other countries, Bangladesh's RER will appreciate (depreciate).

While nominal variables have no effect on the long-run RER, they do affect the RER in the short run. A nominal depreciation leads to an immediate RER depreciation, but it is eroded over the medium term if the fundamentals do not warrant such RER depreciation (Edwards 1989). The same is true of domestic credit whose growth alters the RER, until price level increases reduce real domestic credit (money balances) to its original level.

The basic model we estimate in the next section is shown in equation (11) below:¹⁷

$$(11) \text{ LN (RER) } = a_0 + a_1 \text{ COMP} + a_2 \text{ GEXP} + a_3 \text{ LN (TOT)} \\ + a_4 \text{ PRODIFF} + a_5 \text{ CADEFG} + a_6 \text{ NOMVAR}$$

where we use the following notation:

ADPSHR	Composition of government expenditure proxied by share of capital (ADP) expenditure in total Government expenditure (i.e. τ_1 in equation 10). ¹⁸
GEXPG	Total government expenditure as a share of GDP (i.e. 'g').
RER	Real Exchange Rate Index (seven different indices) where a rise in the index is an appreciation.
CADEFG	Current account deficit as a share of GDP (i.e. -cas).

¹⁷Since five of the six explanatory variables of the basic model are in ratios or rates of change, we use natural logs of terms of trade and the real exchange rate index.

¹⁸Some have proxied composition by the ratio of capital to current expenditure. The measure is equivalent to ours as they differ by a constant.

TOT	The terms of trade defined as the ratio of the dollar export price index to import price index (i.e. 'T').
PRODIFF	Measure of Productivity Difference proxied by difference between Bangladesh's export growth rate and that of to a set of six comparable countries. ¹⁹
NOMVAR1	Nominal variable like devaluation where the nominal exchange rate is expressed as local currency per US dollar.
NOMVAR2	Nominal Variable like domestic credit growth rate.

¹⁹A simple average of export growth rates of India, China, Indonesia, Thailand, Pakistan and Singapore is used.

IV. ECONOMETRIC ESTIMATION OF THE RER MODEL

Notwithstanding the well-known problems of estimating a single-equation model instead of a simultaneous equation macro-model, we estimate the basic model directly. In view of the small size of our sample (i.e. annual observations for 16 years), our choice of estimation technique was limited to ordinary least squares (OLS), which is in line with the practice of others (Edwards 1989, Cottani et al 1990, Rodriguez 1991, Easterly 1991).²⁰ However, to overcome the problem of 'simultaneity bias' arising from the fact that the current account is an explanatory variable, we estimate a reduced form RER model by replacing the current account variable with its determinants. While the explanatory power of the model rises, the estimated coefficients of the reduced form are not significantly different from those of the basic model.

Estimation Results of Basic Model

The basic model is estimated for seven different measures of the real exchange rate (RER). Table 2 provides the estimation results. The reported results of the basic model excludes those with NOMVAR1 or NOMVAR2 because they had insignificant coefficients for all the RER measures. Dropping them improves both the fit of the RER equation and the precision of the coefficient estimates.

²⁰This has been the estimation technique of choice even when there was a larger sample of pooled cross section data (Edwards 1989, Cottani et al 1990).

The coefficients for both the level and composition of government expenditure are significant in virtually all of the estimated equations.²¹ They are not significantly different across the equations. The results show that increases in the level of total government expenditure (GEXPG) and in the share of capital expenditure in total expenditure i.e. composition (ADPSHR) depreciates the real exchange rate. The coefficients on the other variables are also significant and of the right sign for most of the RER measures.

Simultaneity Bias

However, the fact that changes in the current account may be simultaneously affected by RER raises the possibility of simultaneity bias in the estimated coefficients of the basic model in Table 2. Though we could overlook this by arguing that the extent of simultaneity bias is likely to be small for several reasons,²² we seek to address the problem in the best possible way instead.

²¹The only exception is the coefficient estimate for expenditure compositions in the RERT measure.

²²First, in the context of low income countries like Bangladesh where "aid" finances most of the current account deficit, such deficits can be viewed as more exogenous than in most countries. It is more likely to affect RER charges, instead of being affected by it. Second since the current account is mainly a function of aggregate expenditure-income balance over the medium term, changes in the real exchange rate with no change in aggregate expenditure-income balance is unlikely to have a marginal effect on the current account. Third many empirical studies have been unable to detect a significant effect of RER on the trade balance (Pritchett 1991, Rose 1991). Some of these arguments are implicit or explicit in studies reporting single-equation RER models the current account/capital inflow variable on the right hand side (Cottani et al 1989, Rodriguez 1991, Easterly 1991). Notwithstanding the above, it is difficult to rule out all effects of RER on the current account

The small size of our sample severely limits our options on alternative estimation techniques. One way to avoid the simultaneity bias in the estimated coefficients is to estimate a reduced form RER model. We obtain the reduced form equation by replacing the current account variable in the basic model with its determinants. For example our structural model obtained in Section III is:

$$(12) \quad \text{LN(RER)} = a_0 + a_1 \text{ADPSHR} + a_2 \text{GEXPG} + a_3 \text{LN(TOT)} \\ + a_4 \text{XGRDIIF} + a_5 \text{CADEFG}$$

Current account deficit as a share of GDP (CADEFG) is assumed to be a function of real exchange rate, real aid disbursements (RAID) and output or real GDP (RGDP). Thus:

$$(13) \quad \text{CADEFG} = b_0 + b_1 \text{LN(RER)} + b_2 \text{LN(RAID)} + b_3 \text{LN(RGDP)}.$$

Substituting (13) into (12) we get the reduced form as follows:

$$(14) \quad \text{LN(RER)} = C_0 + C_1 \text{ADPSHR} + C_2 \text{GEXPG} + C_3 \text{LN(TOT)} + C_4 \text{PRODIFF} \\ + C_5 \text{LN(RAID)} + C_6 \text{LN(RGDP)}$$

$$\text{where } C_0 = \frac{a_0 + a_5 b_0}{1 - a_5 b_1}$$

$$C_1 = \frac{a_1}{1 - a_5 b_1}$$

$$C_2 = \frac{a_2}{1 - a_5 b_1}$$

$$C_3 = \frac{a_3}{1 - a_3 b_1}$$

$$C_4 = \frac{a_4}{1 - a_3 b_1}$$

$$C_5 = \frac{a_5 b_2}{1 - a_3 b_1}$$

$$C_6 = \frac{a_5 b_3}{1 - a_3 b_1}$$

None of the structural coefficients (i.e. 'a' of equation 12) can be recovered from the estimates of the reduced form equation (14). Nevertheless, the estimated coefficients gives us 'true' overall response of the real exchange rate to fiscal adjustment.

Estimation Results of Reduced Form Model

The estimated coefficients of the reduced form in Table 3 are similar to those of the basic model in Table 2 in terms of both sign and significance. The estimates are reassuringly robust to alternative RER measures and alternative determinants of current account deficit.²³ The overall fit of the reduced form equations are better than those of the basic model.

²³Alternative reduced form equations arising from alternative sets of explanatory variables determining the current account (i.e. in equation 13) do not change the coefficient estimates for expenditure variables significantly.

(1) *Government expenditure*

The coefficients for composition of government expenditure and for total government expenditure are the most robust both in sign, and significance. They are significant (at less than 10% level)²⁴ and have the expected sign in six out of seven equations. The coefficients on both the level and composition of government expenditure are not significantly different across the equations and between the two models estimated. For expenditure composition the estimated coefficient from reduced form in Table 3 is lower and less precisely estimated than those in Table 2, but both the estimates are not significantly different from unity.²⁵ As for total government expenditure (GEXPG), again their reduced form estimates are not significantly different from those estimated in the basic model and the precision level is the same.

Increases in the level of total government expenditure and in the share of capital (ADP) expenditure in total expenditure depreciates the real exchange rate. For any given total public expenditure, a shift in its composition away from capital or ADP expenditure appreciates the real exchange rate. Thus the effect of a given reduction in total expenditure on RER will be different if it is accompanied by a change in composition of such expenditure, than if it is not. This suggests that specifications of RER models for Bangladesh that ignore

²⁴Even in the RERT equation (column 1, table 4 and 6) the coefficient for total government expenditure is significant and of the right sign; that for composition is not significant.

²⁵T-tests confirm that they are not significantly different from one.

public-expenditure-composition are likely to produce real exchange rate elasticities with respect to total public expenditure that are unstable.²⁶

(ii) Terms of trade

The coefficient of the terms of trade is significant in five and four out of seven RER equations in Tables 2 and 3 respectively. Though their signs differ across RER measures in each Table, the same sign is obtained for the same RER measure in both cases. Terms of trade improvement leads to RER appreciation for all measures except the export price based RER; it leads to a depreciation in the latter measure (i.e. RPX and RPX1).

This difference in sign is perhaps not as surprising as it first seems. While the income effect of a terms of trade improvement on the price of non-tradables (e.g. CPI and CPI¹) is similar irrespective of whether export or import price changes cause the terms of trade improvement, the effect on relative prices (i.e. on RER indices) need not be. This is because the proxy for tradable prices in the RER index (the denominator in our indices) may move differently depending on which price index proxy tradable prices and on which price change, import or export price change causes the terms of trade improvement. Since RPX and RPX1 measures use export prices and export price increases have dominated Bangladesh's terms of trade improvements, the difference in sign is not surprising.²⁷

²⁶ This raises questions about the stability of expenditure coefficients in RER models estimated recently for other countries (Edwards 1989, Cottani et al 1990, Rodríguez 1991, Easterly 1991), because they ignore expenditure composition.

²⁷ Simple regressions of CPI, CPI1 and PX on terms of trade confirm this association. If the rise in dollar export price rise causing the terms of trade improvement is larger than the rise in non-tradable prices caused by the income effect of export price increases, which is not unlikely given that the

Elasticity Estimates

The elasticity of RER for expenditure level is larger than for expenditure composition. A 10% increase in the level of total government expenditure relative to its mean, depreciates the RER by anywhere between 5.5% and 9.7% while similar percentage rise in the share of capital in total expenditure depreciates the RER by between 3.8% and 4.8%. They are shown in Table 4.

Yet, over the 1980s changes in composition had a greater appreciation effect than decreases in expenditure level. The actual fall in total expenditure from 19.7% of GDP in FY 1983 to 17.4% in FY 1990 tended to appreciate the RER by between 6% and 8%, whereas actual fall in the share of capital expenditure in total expenditure over the same period tended to appreciate the RER by anywhere between 10% and 14%. Thus changes in composition of total government expenditure contributed around two-thirds of the total RER appreciation effect of fiscal adjustment.

income effect will take some time to work itself out, the sign can be negative.

VI. IMPLICATIONS OF FISCAL ADJUSTMENT

The nature of fiscal adjustment implemented by Bangladesh²⁸ has important policy implications. Whether it is sustainable or not the RER effect of fiscal adjustment depends critically on the way fiscal deficit and/or total expenditure is reduced. When fiscal adjustment is sustainable, the resulting change in real exchange rate is an equilibrium change that is consistent with the maintenance of long-run external balance. Nevertheless, even sustainable fiscal adjustment that involves a large shift in expenditure composition towards non tradables should not be carried out simultaneously with trade liberalization because the resulting RER appreciation, will undermine liberalization. When such fiscal adjustment is unsustainable and temporary as is the case in Bangladesh, the problems are compounded because the magnitude of RER appreciation is not an equilibrium one. The RER becomes misaligned in a long run sense (Lizondo 1989), and resources get misallocated. We discuss each of these implications in turn.

Alternative Fiscal Adjustment Policies

Alternative fiscal adjustment policies aimed at reducing the same fiscal deficit have different RER effects. Fiscal deficit can be reduced either through some combination of lower expenditure and higher revenue or through expenditure reductions only. Even if deficit reduction is undertaken mainly through expenditure reductions, as was the case in Bangladesh, different ways of reducing

²⁸A 10 percent reduction in total public expenditure/GDP was accompanied by a 26% decline in the share of capital expenditure in total expenditure, between FY 1983 and FY 1990.

total expenditure have different effects on composition of total expenditure, which in turn has different effect on the RER.

The same actual reduction in Bangladesh's total expenditure between FY 1983 and FY 1990 could have been undertaken in at least two other ways that would have implied less RER appreciation and would have been less adverse for Bangladesh's external sector competitiveness.²⁹ The first would involve equivalent reductions in both current and capital expenditure, such that the composition of Bangladesh's total expenditure would not change. The resulting RER appreciation would have been only around a third of the actual appreciation effect over that period. Similarly, the second way would require that the entire change in total expenditure was borne only by current expenditure. In that event there would be little or no appreciation effect resulting from fiscal adjustment.

We carry out a simulation to show how the RER would have moved if the actual reductions in total expenditure were carried out in the two hypothetical ways described above. Figure 3 shows three graphs of Bangladesh's RER predicted by the equation for RPT in Table 3 on three basis: (a) RER predicted using actual changes in all variables, (b) RER predicted using actual changes in all variables except expenditure composition (ADPSHR) which is held unchanged at FY 1981 level, (c) RER predicted using actual changes in all variables except expenditure

²⁹Equivalent reductions in current and capital expenditure would have ensured a constant ADP share.

composition, but in this case ADPSHR rises³⁰, because total expenditure is reduced by reducing current expenditure only.

Figure 3 is self explanatory. Both ways of reducing total expenditure implies a less appreciated real exchange rate in every year after FY 1983. The difference is most pronounced after FY 1987. Actual movement of other fundamentals would have led to substantial RER depreciation since FY 1987, if Bangladesh's fiscal adjustment had reduced total expenditure in any of the above described two ways rather than the way it actually did.

Trade Liberalization

This means that Bangladesh's fiscal adjustment could have avoided undermining competitiveness and thus the potential supply response to the ongoing trade liberalization. If fiscal adjustment contributes to actual RER appreciation during liberalization, it provides confusing signals and undermines producers' incentives to move resources to the export sectors which trade liberalization seeks to encourage. The 'wait-and-see' strategy of potential exporters in the face of import liberalization, undermines the credibility and sustainability of liberalization (Rodrik 1991, Corbo and de Melo 1987).

Even when such fiscal adjustment does not lead to an actual RER appreciation but instead reduces the extent of RER depreciation that accompany the trade

³⁰Current expenditure as a share of GDP changes by exactly the same direction and magnitude each year after FY 1983, as total expenditure as a share of GDP. Since ADP expenditure as a share of GDP is constant, share of capital expenditure (ADPSHR) rises.

liberalization, it can increase transitional unemployment from the liberalization.

This is because for a given reduction in implicit or explicit tariffs, a lower depreciation implies a larger immediate fall in the price and profitability of import substitutes. The consequent profit squeeze leads to greater immediate unemployment in the import-substitute sector.³¹ On the export side with no real depreciation (or a lower real depreciation) the relative profitability of export sector improves only vis-a-vis import substitutes after liberalization but does not improve (or improves less) vis-a-vis non tradables. Thus the lower the real depreciation accompanying liberalization, the more likely it is that the expansion of the export sector is less pronounced³². This sector is therefore less effective in absorbing the labor shed by import-substituting sectors. In short, fiscal adjustment of the type Bangladesh undertook should preferably not be implemented simultaneously with trade liberalization.

Misaligned RER

Even if there is no trade liberalization and the magnitude of RER appreciation is in line with changes in current fundamentals including government expenditure, unsustainable fiscal adjustment can overvalue the RER in a long-term sense (Lizondo 1989). Though given the small sample size, it was not possible

³¹The extent of employment loss in this sector depends on the flexibility of nominal wages and the rate of inflation. If inflation is low and nominal wages inflexible downwards, the transitional employment loss effect will be larger.

³²This is because the relative price of exports to nontradables rises less with a lower depreciation.

to decompose the time series into 'permanent' and 'temporary' components to test for the differential effects of each, it is not difficult to argue that the changes in Bangladesh's expenditure composition is unsustainable.³³. Nevertheless it is more than likely that private sector decisions affecting the RER were not influenced by that unsustainability.

Ideally the RER response to unsustainable shifts in composition should reflect private sector demand and supply decisions based on that "unsustainability." In that event, the RER appreciation in response to a given unsustainable shift in composition would be negligible. If a part of the change is temporary, the appreciation would be much smaller than if the same shift was wholly sustainable or permanent. However, if this unsustainability is not perceived by Bangladesh's private sector and their demand and supply responses are thus based only on the current not on the long-run values of public expenditure, the RER appreciation in response to a change in current composition of expenditure, would be larger than the equilibrium level. The same is true, if the private sector perceives the unsustainability but is unable to incorporate this information into its actual demand and supply decisions because it is constrained by controls or by liquidity constraints.

In both situations the appreciated RER is misaligned or departs from long-run equilibrium but resources continue to be allocated on the basis of that misaligned RER if producers do not perceive the misalignment. Even if they perceive the misalignment and expect a future depreciation, domestic capital

³³The FY 1991 budget of Bangladesh government and the country projections of donors confirm a reversal in the trend of the share of capital (ADP) expenditure over the next three years.

market imperfections may prevent them from investing in tradables today to take advantage of that depreciation tomorrow. If there are significant "externalities" in the tradable sector (e.g. learning-by-doing externality or export marketing externality), then the lower allocation of resources to the tradables sector today arising from a more appreciated RER imply significantly greater costs over the long-run.

Conclusion

Bangladesh presents a case of fiscal adjustment with little restraint on growth of current expenditure. As a result, there was a large shift in the composition of total government expenditure towards current expenditure which is more intensive in non-tradables. This tended to appreciate the real exchange rate. The appreciation effect was greater than would be the case, if fiscal deficit had been reduced without altering the composition of government expenditure. While simultaneous movements in other fundamentals like terms of trade deterioration and trade liberalization averted actual real appreciation of such magnitude Bangladesh's RER remained less depreciated than it would without such fiscal adjustment.

The effect of fiscal adjustment on RER, especially when it involves a shift in the composition of total government expenditure, is of importance to a large number of developing countries. Fiscal adjustment should thus focus not only on the size of the deficit that has to be bridged and the level of expenditure that has to be reduced, but also on the composition of expenditure that such adjustment generates. Large shifts in composition of expenditure towards non

tradables can cause 'difficulties' both when they are sustainable and when they are not. When they are not sustainable, the real exchange rate becomes misaligned and resources are likely to get misallocated in the presence of domestic capital market imperfections. When they are sustainable there is no problem, unless such fiscal adjustment is carried out simultaneously with trade liberalization. In that situation the incipient real exchange rate appreciation arising from fiscal adjustment undermines trade liberalization.

DATA ANNEX

The data series used in the econometric estimation of the basic model are given in the Annex, and are all taken from World Bank sources. The GDP series used is the new series with the base of 1984/85.

Bangladesh's Annual Development Program (ADP) expenditure reported in the budget, proxies capital expenditure. This expenditure category consists predominantly of projects involving fixed investment. Budget data on current expenditure proxy government consumption. Data on Bangladesh's "actual" government expenditure is not available prior to 1980/81. Only "revised budget" figures are available for the entire period of 1972/73 to 1989/90. Revised budget figures are government's estimates of "actual" revenue and expenditure made provisionally after eleven months of the relevant fiscal year has elapsed. It is announced at the time of each budget for the previous fiscal year. This is thus the only consistent series for the period available for our exercise that is closest to "actual" public expenditures.

The measures of real exchange rates were computed specifically for this paper. The available estimates are those that are most commonly used by monetary authorities, but are far from ideal in terms of both concept and coverage as an indicator of relative price of tradables facing Bangladeshi producers. Though the available data on price indices makes it difficult to compute or estimate the "correct" empirical equivalent of the real exchange rate concept, it is possible to improve on the available measure of real exchange rate by using a better proxy for tradable prices. In any case, given the problems of measurement, a number

of different RER measures is preferable to a single measure.³⁴ Table A-2 provides a set of seven RER measures used for estimation.

The current account deficit as a share of GDP is computed by deflating the dollar value of the deficit by Bangladesh's import price index and expressing it as a share of constant dollar value of Bangladesh's GDP. Similarly the dollar value of total aid disbursement is deflated by the import price index to obtain real aid levels. The productivity growth variable is proxied by the difference between Bangladesh's annual export growth rate and the average annual export growth rate of a set of comparable countries.

Table A-1 provides the data taken from World Bank sources, Table A-2, the computed real exchange rates and Table A-3, the variables used in the regressions.

³⁴Surprisingly few studies use several RER measures. One exception is Corbo (1985).

Table 1Government Revenue and Expenditure

<u>Fiscal Years</u>	<u>1981</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>
	<u>(Percentage of GDP)</u>								
<u>Total Revenue</u>	<u>9.3</u>	<u>8.7</u>	<u>8.1</u>	<u>8.8</u>	<u>9.1</u>	<u>8.9</u>	<u>8.9</u>	<u>9.5</u>	<u>9.3</u>
<u>Total Expenditure</u>	<u>18.4</u>	<u>19.7</u>	<u>17.2</u>	<u>16.2</u>	<u>16.6</u>	<u>17.3</u>	<u>16.1</u>	<u>16.7</u>	<u>17.4</u>
Current Expenditure	5.6	6.5	6.5	6.5	7.5	7.7	8.1	8.5	8.4
Food Account Deficit	2.0	2.2	1.2	1.1	0.4	0.1	0.9	0.6	1.5
Development (ADP) Expenditure	10.1	10.2	8.5	7.5	7.8	8.6	6.4	6.7	6.8
Other Capital Expenditure	0.7	0.8	1.0	1.1	0.9	0.9	0.7	0.9	0.7
<u>Overall Fiscal Deficit</u>	<u>9.0</u>	<u>11.0</u>	<u>9.1</u>	<u>7.4</u>	<u>7.5</u>	<u>8.4</u>	<u>7.1</u>	<u>7.2</u>	<u>8.1</u>
	<u>(Percentage of Total Expenditure)</u>								
Development Expenditure	55.1	51.6	49.7	46.1	47.1	49.8	39.6	40.1	39.1

Source: Table 1.5 in World Bank (1991) p. 14

Note: 1981 refers to fiscal year July 1980 to June 1981

Table 2: Estimation Results of Basic Model
(FY 1975-FY 1990)

Dependable Variable is the Log of the Real Exchange Rate (RER) Index

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>Measure of RER</u>	RERT	RPT	RPX	RPM	RPT1	RPX1	RPM1
Constant	0.95	1.10	1.13	1.12	1.68	1.71	1.72
Capital Exp./Total Govt. Exp.	0.02 (0.05)	-1.01*** (-4.02)	-1.02*** (-3.75)	-1.02*** (-4.03)	-1.47* (-2.04)	-1.41* (-1.82)	-1.46* (-2.04)
Total Govt. Exp/GDP	-7.01*** (-5.89)	-3.97*** (-5.35)	-4.05*** (-4.99)	-4.00*** (-5.34)	-4.87*** (3.51)	-5.16*** (-3.63)	-5.07*** (3.69)
Log Terms of Trade (Price of Exports to imports)	-0.04 (0.29)	0.16* (1.95)	-0.60*** (-6.64)	0.39*** (4.73)	0.05 (0.38)	-0.71*** (-4.88)	0.28* (1.97)
Productivity Growth (export differences)	0.25 (1.67)	0.22** (2.41)	0.21* (2.10)	0.21* (2.27)	0.42*** (3.18)	0.40** (2.95)	0.40*** (3.09)
Current Account Def. GDP	2.37** (2.39)	1.57** (2.53)	1.46** (2.17)	1.54** (2.46)	0.43 (0.49)	0.35 (0.39)	0.39 (0.46)
AR (1)	--	--	--	--	0.73** (2.47)	0.75** (2.50)	0.75** (2.60)
R ²	<u>0.88</u>	<u>0.91</u>	<u>0.93</u>	<u>0.91</u>	<u>0.86</u>	<u>0.88</u>	<u>0.87</u>
F Statistic	23.1	31.4	42.5	33.0	15.8	19.2	17.3
D. W. Statistic	2.32	2.02	1.85	1.96	2.22	2.25	2.26
No. of Observations	16	16	16	16	16	16	16

Notes: Data in parenthesis are t-statistics. *** Significant at 1% or less
** Significant at between 1 and 5%. * Significant at between 5 and 10%.

Table 3: Reduced Form Estimate of RER Model
(FY 1975-FY 1990)

Dependent Variable is the log of the Real Exchange Rate (RER) Index

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>Measure of RER</u>	RERT	RPT	RPX	RPM	RPT1	RPX1	RPM1
Constant	4.34	1.73	1.51	1.60	-3.35	-3.57	-3.97
Capital Exp./Total Govt. Exp.	-0.04 (-0.07)	-0.70** (-2.53)	-0.70** (-2.63)	-0.69** (-2.61)	-0.88* (-2.15)	-0.87* (-2.13)	-0.87** (-2.28)
Total Govt. Exp/GDP	-7.30*** (-3.85)	-3.51*** (-3.73)	-3.52*** (-3.93)	-3.56*** (-3.94)	-6.10*** (-4.38)	-6.10*** (-4.39)	-6.14*** (-4.35)
Log Terms of Trade (Price of Exports to imports)	-0.04 (0.21)	-0.03 (-0.23)	-0.80*** (-8.82)	0.20** (2.29)	-0.03 (-0.21)	-0.81*** (-5.75)	0.19* (1.40)
Productivity Growth	0.12 (0.55)	0.39*** (3.58)	0.41*** (3.92)	0.39*** (3.74)	0.44*** (2.72)	0.46** (2.82)	0.44*** (2.80)
Log GDP	-0.23 (0.55)	-0.31** (-2.26)	-0.31** (-2.92)	-0.31** (-2.36)	0.32 (1.59)	0.32 (1.57)	0.32 (1.64)
Log real aid	-0.03 (-0.11)	0.43*** (3.11)	0.47*** (3.57)	0.45*** (3.36)	0.13 (0.64)	0.17 (0.83)	0.15 (0.74)
R ²	<u>0.84</u>	<u>0.92</u>	<u>0.96</u>	<u>0.93</u>	<u>0.91</u>	<u>0.93</u>	<u>0.92</u>
F Statistic	13.8	30.5	54.8	35.9	25.2	32.3	28.6
D. W. Statistic	2.12	2.17	2.19	2.14	2.25	2.21	2.25
No. of Observations	16	16	16	16	16	16	16

Notes: 1. Where the GDP share of current account deficit is assumed to be a function of real exchange rate, real aid disbursement and real GDP.

Table 4: RER Elasticity with Respect to Fiscal Variables
 (Percentage Change in RER)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
10% Rise in:	RPT	RPX	RPM	RPT1	RPX1	RPM1	RERT
Capital Exp./Total Govt. Exp.	-3.81	-3.81	-3.76	-4.79	-4.74	4.74	n.s
Total Govt. Exp/GDP	-5.55	-5.57	-5.63	-9.64	-9.71	-9.71	-11.54

Source: Computed using mean values of fiscal variables and coefficients from Table 3.

CAPITAL & CURRENT EXPENDITURES

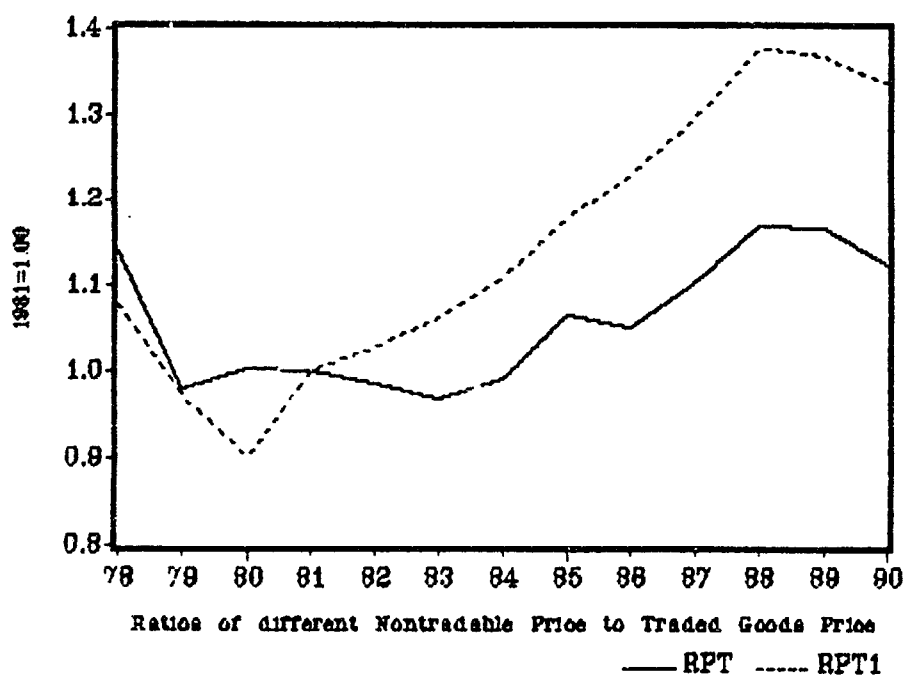


(Capital Expenditure is the GDP share of ADP Expenditure)

—— Capital ---- Current

Figure 2

TRADED GOODS BASED RER MEASURES



COMPOSITION OF GOVERNMENT EXPENDITURE

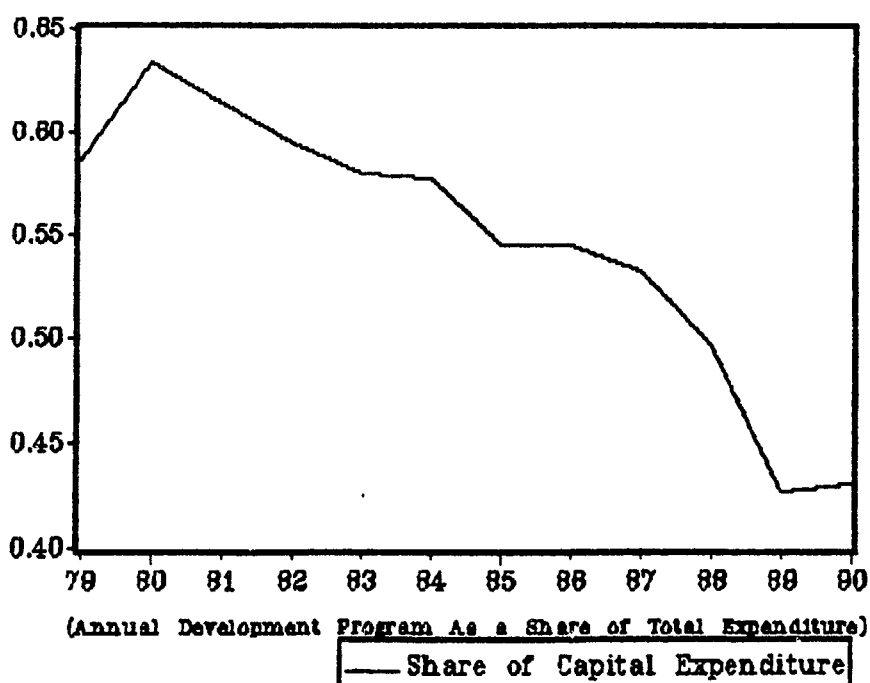
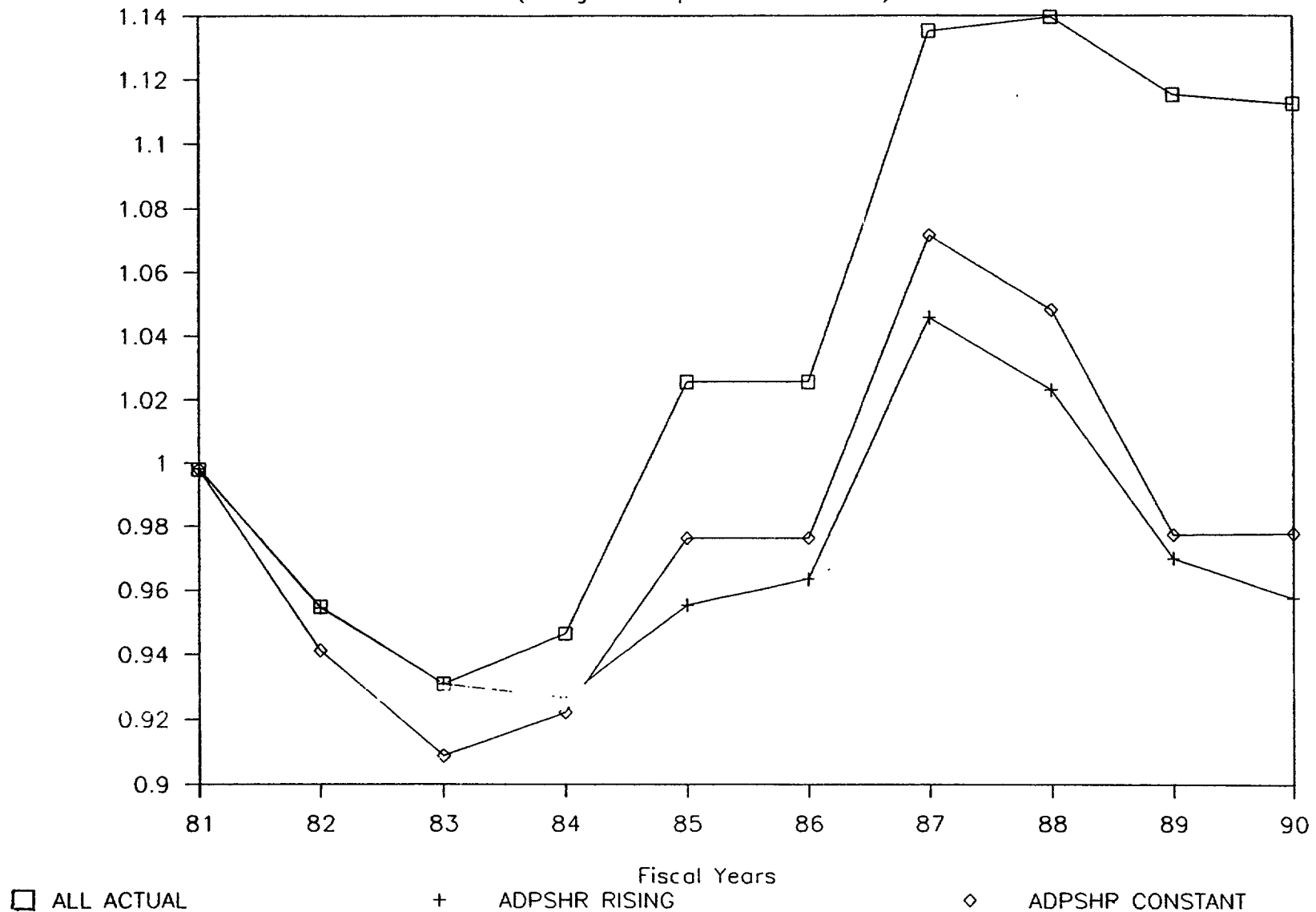


Figure 3

RER WITH ALTERNATIVE FISCAL ADJUSTMENT

(Using RPT Equation in Table 3)



REFERENCES

- Balassa, B. (1964), "The Purchasing Power Parity Doctrine: A Reappraisal," Journal of Political Economy, 72, December.
- Chhibber, A. and M. Dailami (1990) "Fiscal Policy and Private Investment in Developing Countries" Ricerche Economiche, April-September.
- Chow, G. C. (1960) "Tests of Equality between set of Coefficients in Two Linear Regressions," Econometrica 28.
- Corbo, V. (1985) "Reforms and Macro economic Adjustments in Chile" World Development, 13, August.
- Corbo, V. and J. de Melo (1987), Lessons for the Southern Cone Policy Reforms World Bank Research Observer, 2 July.
- Cottani, J., D. Cavallo and S. Khan (1990) "Real Exchange Rate Behavior and Economic Performance in LDCs" Economic Development and Cultural Change, 39, October.
- Easterly, W. (1991) "Macroeconomics of Public Sector Deficits: Case of Colombia", WPS No. 626, Country Economics Dept., World Bank, Washington.
- Edwards, (1989) Real Exchange Rate, Devaluation and Adjustment: Exchange Rate Policy in Developing Countries (MIT Press).
- Faini, R. and J. de Melo (1991) "Adjustment, Investment and the Real Exchange Rate" Economic Policy 11.
- Hicks, Norman (1991): "Expenditure Reductions in Developing Countries Revisited" Journal of International Development (UK) January.
- Jarque, C.M. and A. Bera (1980), "Testing the Normality Assumption" Economic Letters Vol. 6.
- Khan, M. and J. Lizondo (1987) "Devaluation, Fiscal Deficits and the Real Exchange Rate", World Bank Economic Review, January.
- Lizondo, J. (1989), Overvalued and Undervalued Exchange Rates in an Equilibrium optimizing Model, WPS No. 223, Country Economics Dept., World Bank, Washington.
- Matin, K. (1990), "Structural Adjustment Under the Extended Fund Facility, World Development 18 (C) p. 815-830, June.
- Monteil, P., 1986 "Long Run Equilibrium in a Keynesian Model of small open Economy," IMF Staff Papers 33, March.

- Neary, P. and S. VanWijnbergen (1986) "Natural Resources and the Macroeconomy: A Theoretical Framework" in Neary and VanWijnbergen (ed) Natural Resources and the Macroeconomy (MIT Press).
- Pritchett, L. (1991), "Trade Balance and Real Exchange Rate in Developing Countries" (Mimeo, Trade Policy Division).
- Ramangkura, V. and B. Nidhiprabha (1991) "The Macroeconomics of the Public Sector Deficit: Case of Thailand" WPS No. 633, Country Economics Dept., World Bank, Washington D.C., March.
- Ramsey, J.B. (1969) "Tests for Specification Errors in Classical Linear Least Squares Regression Analysis" J. of Regional Statistical Society Vol. 31.
- Rodriguez, C. (1989), Macroeconomic Policies for Structural Adjustment, WPS 247, Country Economics Dept. World Bank, Washington, August.
- Rodriguez, C. (1989) Macroeconomic Policies for Structural Adjustment, WPS 247, Country Economics Department, World Bank, Washington, D.C.
- Rodriguez, C. (1991) Macroeconomics of Public Sector Deficits: The Case of Argentina, WPS 632, Country Economics Dept., World Bank, Washington, D.C.
- Rodrik, D. (1989) "Promises, Promises: Credible Policy Reform Via Signalling" Economic Journal, 99 September.
- Rose, A. K. (1991) "Role of Exchange Rates in a Popular Model of International Trade: Does Marshall-Lerner Condition Hold?" Journal of International Economics, 30 May.
- Tanzi, V. (1990) "Fiscal Issues in Adjustment Programs" Ricerche Economiche, April-September.
- Thomas, V., K. Martin and J. Nash (1990) Lessons in Trade Policy Reform, Policy & Research Series No. 10 (PRE, World Bank, Washington, D.C.)
- White, H. (1980) "A Heteroskedasticity, Consistent Covariance Estimator and Direct Test for Heteroskedasticity, Econometrica 48.
- World Bank (1985) Bangladesh: Economic and Social Development Prospects Report No. 5409-BD, April.
- World Bank (1988) World Development Report, 1988 July.
- World Bank (1989) Bangladesh: Public Expenditure Review Report No. 7545-BD, March.
- World Bank (1991) Bangladesh: Managing Public Resources for Higher Growth, Report No. 9379-BD, April.

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS828	How the Macroeconomic Environment Affects Human Resource Development	Arvil Van Adams Robert Goldfarb Terence Kelly	January 1992	V. Charles 33651
WPS829	Regulation of Securities Markets: Some Recent Trends and Their Implications for Emerging Markets	Terry M. Chuppe Michael Atkin	January 1992	F. Harbottle 39616
WPS830	Fixed Parity of the Exchange Rate and Economic Performance in the CFA Zone: A Comparative Study	Ibrahim Elbadawi Nader Majd	January 1992	V. Barthelmes 39175
WPS831	Real Overvaluation, Terms of Trade Shocks, and the Cost to Agriculture in Sub-Saharan Africa	Ibrahim Elbadawi	January 1992	V. Barthelmes 39175
WPS832	Sustainability and the Economics of Assuring Assets for Future Generations	Richard B. Norgaard	January 1992	J. Shin Yang 81418
WPS833	Stabilization and Growth Recovery in Mexico: Lessons and Dilemmas	Daniel F. Oks	January 1992	L. Franchini 38835
WPS834	Scenarios for Growth in the 1990s	Shahrokh Fardoust Jian-Ping Zhou	January 1992	J. Queen 33740
WPS835	Commodity Stabilization Funds	Patricio Arrau Stijn Claessens	January 1992	S. King-Watson 31047
WPS836	Sources of Income Inequality in Rural Pakistan: A Decomposition Analysis	Richard H. Adams, Jr. Harold Alderman	January 1992	C. Spooner 30464
WPS837	Manpower Planning in a Market Economy with Labor Market Signals	Arvil Van Adams John Middleton Adrian Ziderman	January 1992	S. Khan 33651
WPS838	Measuring Trade Policy Intervention: A Cross-Country Index of Relative Price Dispersion	Brian J. Aitken	January 1992	R. Martin 39065
WPS839	Regional Integration Under VERs: When Trade Diversion is Unambiguously Beneficial	David G. Tarr	January 1992	D. Ballantyne 37947
WPS840	Public Sector Debt, Fiscal Deficits, and Economic Adjustment: A Comparative Study of Six EMENA Countries	Alfredo E. Thorne Azita Dastgheib	January 1992	L. Ly 37352
WPS841	How Access to Contraception Affects Fertility and Contraceptive Use in Tunisia	Susan Cochrane David K. Guilkey	January 1992	O. Nadora S6-065

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS 842	Capital Flows to South Asia and ASEAN Countries: Trends, Determinants, and Policy Implications	Ishrat Husain Kwang W. Jun	January 1992	S. King-Watson 31047
WPS843	How Financial Markets Affect Long-Run Growth: A Cross-Country Study	Ejaz Ghani	January 1992	A. Nokhostin 34150
WPS844	Heterogeneity, Distribution, and Cooperation in Common Property Resource Management	Ravi Kanbur	January 1992	WDR Office 31393
WPS845	Inflation Stabilization in Turkey: An Application of the RMSM-X Model	Luc Everaert	January 1992	B. Mondestin 36071
WPS846	Incorporating Cost and Cost-Effectiveness Analysis into the Development of Safe Motherhood Programs	Larry Forgy Diana M. Measham Anne G. Tinker	January 1992	O. Nadora 31091
WPS847	Coping with the Legacies of Subsidized Mortgage Credit in Hungary	Silvia B. Sagari Loic Chiquier	January 1992	M. Guirbo 35015
WPS848	How EC 1992 and Reforms of the Common Agricultural Policy Would Affect Developing Countries' Grain Trade	Merlinda D. Ingco Donald O. Mitchell	February 1992	P. Kokila 33716
WPS849	Financial Structures and Economic Development	Ross Levine	February 1992	W. Pitayatonakarn 37666
WPS850	Fiscal Adjustment and the Real Exchange Rate: The Case of Bangladesh	Kazi M. Matin	February 1992	D. Ballantyne 38004